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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/889,913	12/13/2001	Kineo Matsui	MES1P043	3027

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• EXAMINER

HENNING, MATTHEW T

ART UNIT	PAPER NUMBER
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2131

DATE MAILED: 09/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/889,913

Applicant(s)

MATSUI, KINEO

Examiner

Matthew T Henning

Art Unit

2131

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 13 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☒ Claim(s) 12 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/13/2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 5.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

This action is in response to the communication filed on 12/13/2001.

**DETAILED ACTION**

1. Claims 1-20 have been examined.

***Title***

2. The title of the invention is acceptable.

***Priority***

3. This application is a 371 of PCT/JP00/00334, filed 01/24/2000, which claims priority to Japanese Application 1115674 filed 01/25/1999.
4. The effective filing date for the subject matter defined in the pending claims in this application is 01/25/1999.

***Information Disclosure Statement***

5. The information disclosure statement (IDS) submitted on 03/11/2003 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the examiner is considering the information disclosure statement.

***Drawings***

6. The drawings filed on 12/13/2001 are acceptable for examination proceedings.

***Specification***

7. Applicant is reminded of the proper language and format for an abstract of the disclosure.

*The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.*

*The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.*

8. The abstract of the disclosure is objected to because

Line 1: The phrase "The technique of the present invention" can be implied and therefore must be removed.

Lines 12-14 recite "The technique...to the public" which refers to purported merits or speculative applications of the invention and therefore must be removed.

Correction is required. See MPEP § 608.01(b).

#### ***Claim Objections***

9. The applicant is reminded that a series of singular dependent claims is permissible in which a dependent claim refers to a preceding claim which, in turn, refers to another preceding claim.

A claim which depends from a dependent claim should not be separated by any claim which does not also depend from said dependent claim. It should be kept in mind that a dependent claim may refer to any preceding independent claim. In general, applicant's sequence will not be changed. See MPEP § 608.01(n).

#### ***Claim Rejections - 35 USC § 112***

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

*The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.*

11. Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant

regards as the invention. The term "sufficiently" in claim 10 is a relative term which renders the claim indefinite. The term "sufficiently" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. One of ordinary skill would not be able to determine how many more elements the pattern would need to be considered sufficiently greater than the number of blocks and therefore could not determine the scope of the claim.

12. Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 12 recites the limitation "the basic pattern having redundancy" in line 2. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 103***

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

*(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.*

14. Claims 1-5, 7-11, and 13-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isnardi et al. (US Patent Number 6,037,984) hereinafter referred to as Isnardi, and further in view of Shin (US Patent Number 6,415,042).

15. Regarding Claim 1, Isnardi recites a method of embedding a digital watermark in a master image (See Isnardi Abstract Line 1), said embedding method comprising the steps of: extracting blocks of a predetermined size from said master image (See Isnardi Col. 3 Lines 52-54); processing image data corresponding to each block by orthogonal transform (See Isnardi Col. 4 Lines 7-11); making the coefficients satisfy a preset order of magnitude according to bit information specified as the digital watermark, so as to embed the information (See Isnardi Col. 4 Paragraph 3); and processing each block with the embedded bit information by inverse orthogonal transform, so as output a resulting image with digital watermark embedded therein (See Isnardi Col. 7 Lines 25-42). However, Isnardi failed to disclose comparing orthogonal transformed coefficients of at least two blocks having a predetermined relationship with each other.

Shin teaches that in order to allow for an evaluation of the quality of a host image, an NxN watermark should be placed in a portion of the 50% of upper significant coefficients selected among an MxM image (See Shin Col. 5 Paragraph 6).

It would have been obvious to the ordinary person skilled in the art at the time of invention to employ the teachings of Shin to the watermarking system of Isnardi by determining which coefficients were most significant in order to select the location for the watermark. This would have been obvious because the ordinary person skilled in the art would have been motivated to provide an accurate estimate of the quality of the host image without having to send the whole watermarked image.

16. Regarding Claim 2, the NxN block was selected from the entire MxM block and therefore the blocks were contiguous (See Shin Col. 2 Paragraph 4).

17. Regarding Claim 3, Isnardi disclosed the use of DCT (See Isnardi Abstract).
18. Regarding Claim 4, Isnardi disclosed the use of a quantizer to quantize the coefficients and then using the quantized coefficients for watermarking (See Isnardi Col. 4 Lines 7-11 and Paragraphs 2-3).
19. Regarding Claim 5, Isnardi disclosed converting the blocks into luminance and chrominance blocks prior to the DCT step (See Isnardi Col. 2 Lines 52-60), and watermarking the blocks (See Isnardi Col. 5 Paragraph 7- Col. 6 Paragraph 1).
20. Regarding Claim 7, Isnardi disclosed comparing the block with a predicted block, derived from the previous block, and then deciding, based on that comparison, whether or not to alter the watermarking procedure (See Isnardi Col. 3 Line 64 – Col. 4 paragraph 1 and Col. 4 Paragraph 5 – Col. 5 Paragraph 1).
21. Regarding Claim 8, Isnardi disclosed using a pseudo-random generator and seed (key) to create the bits to be embedded at each coefficient (See Isnardi Col. 6 Paragraph 4). See also rejection of claim 7 above.
22. Regarding Claim 9, Isnardi disclosed creating a binary watermark pattern and embedding the watermark (See Isnardi Col. 6 Paragraph 3).
23. Regarding Claim 10, Isnardi disclosed watermarking the image iteratively on a block-by-block basis (See Isnardi Col. 2 Lines 27-30) and that multiple coefficients were marked in each block (See Isnardi Figs 3-5). Therefore, it was inherent that there were more watermark elements than number of blocks.
24. Regarding Claim 11, Isnardi disclosed that a binary representation of a trademark or another word was used for the watermark (See Isnardi Col. 6 Paragraph

3). Because the watermark is being used for an image sequence, it was inherent that the watermark over the sequence was redundant.

25. Regarding Claim 13, Isnardi and Shin disclosed extracting blocks of DCT coefficients containing watermark information (See Isnardi Col. 7 Lines 3-9), an inverse DCT operation on the DCT blocks (See Isnardi Col. 7 Lines 38-41), and comparing the coefficients to determine if they match the watermarks (See Isnardi Col. 7 Lines 16-31).

26. Regarding Claim 14, Isnardi disclosed that decompression took place on a block-by-block basis (See Isnardi Col. 2 Paragraph 6).

27. Regarding Claim 15, Isnardi disclosed converting the blocks into luminance and chrominance blocks prior to the DCT step (See Isnardi Col. 2 Lines 52-60), and extracting the watermark information from the coefficients of the received data, which included luminance data (See Isnardi Col. 7 Lines 16-31).

28. Regarding claim 16, Isnardi disclosed extracting the watermark from the watermarked images (See Isnardi Col. 7 Lines 16-31).

29. Claim 17 is rejected for the same reasons as claim 1 above.

30. Claim 18 is rejected for the same reasons as claim 13 above.

31. Claims 19 and 20 are rejected for the same reasons as claims 1 and 13 above and further because Shin disclosed that watermarking can be done with software (See Shin Col. 6 Paragraph 11 – Col. 7 Paragraph 1).

32. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Isnardi and Shin as applied to claim 4 above, and further in view of Bhaskaran et al. (US Patent Number 6,064,764) hereinafter referred to as Bhaskaran.



The combination of Isnardi and Shin disclosed quantizing the coefficients of the DCT transformed blocks (See rejection of claim 4 above), but failed to disclose only embedding the watermark data where the coefficients are not zero.

Bhaskaran teaches that in order to keep the compression rate of the encoding of images, watermark data should not be added where DCT coefficients are equal to zero (See Bhaskaran Col. 5 Paragraph 2).

It would have been obvious to the ordinary person skilled in the art to employ the teachings of Bhaskaran to the watermarking system of Isnardi and Shin by only choosing coefficients that are non-zero to watermark. This would have been obvious because the ordinary person skilled in the art would have been motivated to increase the compression potential of the watermarked image.

33. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Isnardi and Shin as applied to claim 10 above, and further in view of Ohbuchi et al. ("Watermarking Three-Dimensional Polygonal Models"), hereinafter referred to as Ohbuchi.

The combination of Isnardi and Shin disclosed embedding the pattern iteratively (See rejection of claim 10 above), but failed to disclose the pattern being a density pattern.

Ohbuchi teaches that density pattern embedding in polygonal models withstands practically every geometrical transformation attack (See Ohbuchi Page 271 Col. 1 Section 3.5).

It would have been obvious to the ordinary person skilled in the art to employ the teachings of Ohbuchi to the combination of Isnardi and Shin by using a density pattern as the watermark. This would have been obvious because the ordinary person skilled in the art would have been motivated to provide watermark protection to polygonal models as well as plain images.

### ***Conclusion***

34. Claims 1-20 have been rejected.


35. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Cox et al. (US Patent Number 5,915,027) disclosed a method for digital watermarking involving spectral transformations and blocking.
- b. Cox et al. (US Patent Number 6,154,571) disclosed a method for watermarking high quality images, or DVD video, with no visible distortion to the images.
- c. Nakagawa et al. (US Patent Number 6,104,826) disclosed a method for watermarking the luminance portion of an image signal.
- d. Wu et al. (US Patent Number 6,285,775) disclosed a method for watermarking involving random shuffling of blocks before inserting the watermark.
- e. Natarajan ("Robust Public Key Watermarking of Digital Images") disclosed a method for watermarking images involving watermarking a block of image rows.

36. Please direct all inquiries concerning this communication to Matthew Henning whose telephone number is (703) 305-0713 until October 21<sup>st</sup> and (571)272-3790 thereafter. The examiner can normally be reached Monday-Friday from 9am to 4pm, EST.

If attempts to reach examiner by telephone are unsuccessful, the examiner's acting supervisor, Ayaz Sheikh, can be reached at (703) 305-9648 until October 21<sup>st</sup> and (571)272-3795 thereafter. The fax phone number for this group is (703) 305-3718.

Any inquiry of general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-3900.



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